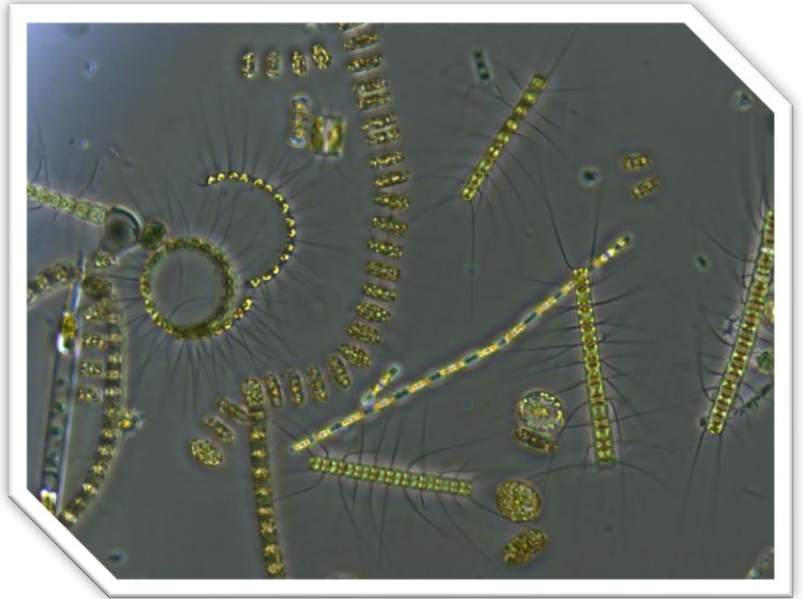


Phytoplankton

Planktic photoautotrophs that are the main producers in the world's pelagic waters (The Ecology of Phytoplankton, 2006). Representative organisms within group of phytoplankton mainly consist of photoautotrophic algae and bacteria (The Ecology of Phytoplankton, 2006). According to Sournia et al. (1991); and Tett & Barton (1995), there are between 4000 and 5000 species of marine phytoplankton that have been described. These species vary widely

between shape, size, and phylogenetic affinity (The Ecology of Phytoplankton, 2006) This causes for high variation in nutrient gathering ways among differing species. However, all phytoplankton convert sunlight into differing forms of useable energy.



History/ Population trends

The term 'plankton' was first used in a monograph created by Viktor Hensen, even though the existence of planktic communities was proven by Johannes Müller several years earlier (Hensen, 1887; The Ecology of Phytoplankton, 2006). On the other hand, Hensen was the first to make a distinction between phytoplankton and other types of plankton. He recognized the ubiquity of phytoplankton as well as its superior abundance in comparison to other streams of available nutrients for seas or oceans (The Ecology of Phytoplankton, 2006). For a comprehensive overview of the history of phytoplankton, read Ecology of Phytoplankton from The Ecology of Phytoplankton (2006). However, Winder and Sommer noted in their paper that climate change has had a significant effect on phytoplankton population dynamics (2012). They state that there is not a decline necessarily, but there is a denotable shift of when phytoplankton bloom happens (Winder and Sommer, 2012). They finalize with noting that these shifts could have tremendous effect on the rest of the ecosystem, but that it is unclear what the effects could be (Winder and Sommer, 2012).

North Sea vs Wadden Sea

Phytoplankton play a vital role in both the North Sea and the Wadden Sea. Nevertheless, significant differences exist between the two seas. An example of such differences is the primary limiter. A study by Colijn and Cadée (2002) revealed that the primary limiter for phytoplankton growth in the Wadden Sea was light, whereas Xu et al. (2020) denotes that nutrient availability is the key factor for phytoplankton growth in the North Sea. On the other hand, both limiters are of consequence in either of the two seas, just to different degrees (Colijn and Cadée, 2002; Xu et al., 2020).

Factors of the study

No migratory species of phytoplankton were found. Not much is known about invasive species nor species that used to be of significance to the food web but no longer fulfill that role. On the other hand, phytoplankton form the basis of the marine food web which in turn means that they have importance for human activities.

Sources

Colijn, F., & Cadée, G. C. (2003). Is phytoplankton growth in the Wadden Sea light or nitrogen limited? *Journal of Sea Research*, 49(2), 83–93. Retrieved September 25, 2024, from: [https://doi.org/10.1016/s1385-1101\(03\)00002-9](https://doi.org/10.1016/s1385-1101(03)00002-9)

Hensen. (1887). ResearchGate. Retrieved September 25, 2024, from: https://www.researchgate.net/figure/Plate-4-from-Hensen-1887-showing-microplankton-collected-during-his-North-Sea-cruise_fig1_353177529

Sournia, A., Chrdtiennot-Dinet, M., & Ricard, M. (1991). Marine phytoplankton: how many species in the world ocean? *Journal of Plankton Research*, 13(5), 1093–1099. Retrieved September 25, 2024, from: <https://doi.org/10.1093/plankt/13.5.1093>

Tett, P., & Barton, E. (1995). Why are there about 5000 species of phytoplankton in the sea? *Journal of Plankton Research*, 17(8), 1693–1704. Retrieved September 25, 2024, from: <https://doi.org/10.1093/plankt/17.8.1693>

The ecology of phytoplankton. (2006). Google Books. Retrieved September 25, 2024, from: https://books.google.nl/books?hl=nl&lr=&id=gDz5jGsPWZYC&oi=fnd&pg=PA4&dq=Phytoplankton&ots=tVvTXflDhQ&sig=xu_ydxtYqmYWWCoxWCGyJrPBP8c#v=onepage&q&f=false

Winder, M., & Sommer, U. (2012). Phytoplankton response to a changing climate. *Hydrobiologia*, 698(1), 5–16. Retrieved September 25, 2024, from: <https://doi.org/10.1007/s10750-012-1149-2>

Xu, X., Lemmen, C., & Wirtz, K. W. (2020). Less nutrients but more phytoplankton: Long-Term Ecosystem Dynamics of the Southern North Sea. *Frontiers in Marine Science*, 7. Retrieved September 25, 2024, from: <https://doi.org/10.3389/fmars.2020.00662>